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National Wealth and Intergenerational Transfers

Expanding sectoral balance sheets with non-monetary assets

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June 2001

Abstract

This paper presents a closed set of balance sheets for the national economy where the wealth of a nation is attributed to households, (pension) funds and the government. Using this framework of national accounting it is shown how the various components of national wealth interact and how a taxonomy for intergenerational transfers can be derived. For some of the items in the balance sheets and for some of intergenerational transfers an estimate of their sizes is given for The Netherlands. However, it is not possible to quantify these all of these transfers because valuation of various immaterial components of wealth is infeasible. Moreover transfers within sectors, which are not shown in the flow of funds derived from the set of sectoral balance sheets, may also have the character of intergenerational transfers. This survey of various intergenerational transfers indicates that generational accounting only considers a small part of intergenerational transfers so that this methodology does not provide much information on intergenerational equity from the perspective of justice.

Keywords: national wealth, intergenerational transfers, monetary models, flow of funds, human capital, social capital

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1. Introduction

The wealth of nations, and its distribution among and between generations, is one of the oldest and principal subjects of (macro) economic research. However, total wealth of a nation appears to be very difficult to measure when all component parts of wealth, such as non-financial and immaterial wealth, are to be included. National accounting focuses on income flows rather than directly on wealth, and financial balances only show financial wealth. Generation accounts, which are designed to measure the (im)balance of intergenerational transfers, only consider part of the transfers between generations.

This paper aims to indicate how the measurement of wealth and intergenerational transfers can be extended to include non-financial and immaterial components. Firstly it illustrates how the different components of national wealth are related in a national accounting framework of sectoral balances. This formal accounting of the components of national wealth allows a classification of the intergenerational transfers of these various wealth components. So, secondly, this paper derives such classification of transfers, and gives an impression of which transfers are of quantitative importance in The Netherlands. In doing so a larger number of wealth components and related transfers is considered than in the usual exercise of generation accounting. The paper relates to the work of Martin Fase in two different ways. Firstly the sectoral balance sheets are adapted from the sectoral balances which form the basis of the macroeconomic models for the monetary sector built by Fase and his team. Secondly, in an early stage of his career Martin Fase has conducted seminal research on the measurement of human capital, which obviously is a major component of the wealth of a nation.

The contents of the paper is as follows. The next section shows how the balance sheets of the MORKMON model of the Dutch economy can be extended with the most relevant non-financial wealth variables. As the focus of the accounting framework is on the components of total wealth, the balance sheets have been condensed as much as possible with respect to the financial items, so that only the items remain which are relevant for the illustration of the interaction. The next section also discusses the background of the non-financial wealth variables included in the balance sheets, and provides a rough quantification for some of the items. Yet, it should be noticed that evaluation of non-financial wealth is always very arbitrary and often not possible at all. Section 3 discusses the classification of transfers and their relative importance. Section 4 concludes.

2. A closed set of balance sheets for the national economy

Large scale empirical macro-economic models of the monetary sector, like the MORKMON model, are traditionally based on a closed set of sectoral balance sheets (see Fase, 1981, 1984; De Nederlandsche Bank, 1985; Den Butter, 1988). The design of the model is governed by two major decisions, namely first on the level of aggregation, i.e. (i) which sectors should be distinguished and which balance sheet items should be modelled explicitly, and (ii) which of the balance sheet items should be explained in behavioural equations, which by technical equations, which will be kept exogenous to the model, and finally which of these items is regarded as the residual item that guarantees the balance sheet identity to hold. Both of these aspects

of the design of the model are crucial for its working and will, of course, depend upon the use of the model in policy analysis.

Most of these sectoral balance sheets of monetary models have at the liability side an item, which is labelled as *net financial wealth*. In the construction of the data set for the monetary model it is almost always the residual item, in the sense that it makes the sum of the items at the assets side equal of the sum of the items on the liability side. However, in the specification of the monetary model, the net financial wealth is not necessarily a residual item. As a matter of fact in the MORKMON-I model in most sectors the net wealth is modelled as exogenous. Only the net wealth of the private sector is endogenous and results from the macro-economic budget restriction. In the MORKMON-II model, which distinguishes more sectors than MORKMON-I, most net wealth variables are indeed endogenous (Fase, Kramer and Boeschoten, 1990, 1992). Here, some of them represent actual valuation of real assets, such as the total value of houses owned by households. Then they are, also in the construction of the data, not a residual item. In those cases registration differences act as residual balance sheet items which are again exogenous in the model specification.

As these monetary models focus on financial assets and liabilities, net wealth variables on the balance sheets of these models only represent a relatively small part of total wealth. This also implies that transmission and feedback mechanisms described by the model relate for a considerable part to financial wealth and to real assets (such as houses) which can be valued in a relatively easy manner. This is not a very serious restriction in the case that the models are designed for short and medium term policy analysis. Yet, when the total wealth of a nation is to be considered from a long term perspective it is necessary to expand these balance sheets with other components of wealth. It can provide an impression of how the total wealth of the nation is distributed over various sectors and how the various parts of total wealth interact. That's why the major exercise of this paper is that it seeks to expand the balance sheets of monetary models – and more specifically of the MORKMON model - which non-financial wealth variables in a consistent way.

The closed set of balance sheets of this section mimics the set of balance sheets of the monetary block of the MORKMON-model for the Dutch economy. As mentioned before this set of balance sheets shows the links between the assets and liabilities in the various sectors of the economy, and is part of national accounting. Changes in the balance sheet items yield flows of funds. Some of these flows can be associated with transfers, either within or between generations. As this paper focuses on these kinds of transfers, the items on the balance sheets of the MORKMON- model are on the one hand condensed and consolidated so that only balance sheet items remain which are directly or indirectly relevant for the taxonomy of transfers. On the other hand, the balance sheets are, in a very simple way, extended with non-monetary assets, and even with immaterial aspects of wealth.

Table 1 shows the closed set of balance sheets. It distinguishes six sectors, namely households, firms, (pension) funds (and life insurance companies), banks, the government sector and the foreign sector. In this set-up banks, including the Netherlands Bank (the Dutch Central Bank), are considered exclusively in their function of money creating institutions; in the other functions (as profit making companies) they are considered as firms. By definition the sum of assets is, in each

balance sheet, equal to the sum of liabilities, where, at the liability side, the net wealth of the sector forms the residual item. It should be noted that because of the necessary consolidation within sectors the net wealth on a sectoral balance sheet may be less than the sum of net wealth on the individual balance sheets of households, firms, etc..

Table 1 A closed set of macro balances of 6 sectors of the national economy

Households		Firms		(Pension)funds	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
G _{g,b} (59)	K _{b,g} (57)	G _{bd,b} (28)	K _{g,bd} (66)	K _{f,bd} (63)	P _{g65- }}
K _{g,o} (3)			K _{b,bd} (70)	K _{f,o} (24)	P _{g65+ }} (169)
K _{g,bd} (66)			K _{f,bd} (63)		
P _{g65- }}					
P _{g65+ }} (169)					
NBA _g (7)	V _g	NBA _{bd} (-85)	V _{bd}	BA _f (81)	V _f
OA _g	OA _g	OA _{bd}	OA _{bd}	OA _f	OA _f

Banks		Government		Rest of the world	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
K _{b,g} (57)	G _{g,b} (59)	SSCH (0)	K _{g,o} (3)	ΣLR (4??)	NBA _g (7)
K _{b,bd} (70)	G _{bd,b} (28)	ΣFT _o (57)	K _{f,o} (24)		NBA _{bd} (-85)
K _{b,o} (30)	SSCH (0)		K _{b,o} (30)		BA _f (81)
IR (5)					NBA _b (-5)
NBA _b (-5)	V _b				IR (5)
OA _b	OA _b	OA _o	OA _o		

$$\Sigma FT_0 + \Sigma LR = V_g + V_{bd} + V_f + V_b$$

with:

G	Money	g	households
K	Credit	bd	firms
P	Pension rights	f	(pension)funds
NBA, BA	(Net) Foreign Assets	b	banks
OA	Other Assets	o	government
IR	International Reserves		
SSCH	Treasury's balance at central bank		
FT	Government's Financial deficit		
LR	Current account		
V	Net wealth of the respective sector		

Note: The values of financial assets in % of GDP according to the data base of MORKMON for 1999 are given in parentheses: these data were kindly provided by the MORKMON team.

This closed set of balance sheets gives a full and consistent description of the financial accounts at the national level. The fact that it is closed means that each item appears two times at one of the balance sheets, namely once at the asset side of a sheet and once at the liability side of another sheet. There are two exceptions. The sum of the net financial wealth of household, firms, funds and banks is equal to the sum of the net debts of the government and of the foreign sector. In flows this identity gives the macroeconomic budget restriction of the country. The second exception is the balance sheet item 'other assets' (OA). This item comprises various types of material

and immaterial capital goods, real property and other immaterial assets, which are difficult to value in terms of money. That's why this item appears both at the asset side and on the liability side of the relevant balance sheet. The fact that the item is labelled 'other' does not imply that it is of less importance. On the contrary, in the present set-up of the balance sheets these items play a crucial role and constitute the essential conceptual extension of a set of balance sheets that gives a complete description of the financial sector only.

In this extension of the financial balance sheets total net wealth of each sector consists of net financial wealth plus the value of these 'other assets'. Because the item 'other assets' appears on both sides of the same balance sheets, the estimate of net wealth may vary without much implication for the economic interaction between sectors. The valuation of the 'other assets' determines to a large extent how rich one thinks that the sector, and consequently, the nation is. In the discussion of the balance sheet items below, ample attention will be paid to the content of the item 'other assets'.

The balance sheet of the households

Net wealth positions of households play an important role in an analysis of transfers within and between generations. Families or households are, from the perspective of economic behaviour, often considered as a unit. There is a practical reason, because it is almost impossible to quantify individual decisions and flow and funds within households. However, from a legal point of view individuals are the owners of assets and wealth. As a matter of fact also from the perspective of intergenerational transfers wealth and assets of households should be assigned to individuals, because members of different generations live together within households. The net financial wealth of households is equal to the financial assets of households minus household debt because of bank credit. The wealth of citizens increases through earnings and transfers such as legacies and bequests. And it decreases because of consumption and gifts. During their life citizens save money and put it in saving accounts at banks, they lend their money to the government (government bonds) and to firms (bonds and shares), and, most importantly, they accumulate pension rights. Savings can also take the form of redemption of mortgages. In this way they build up financial wealth, which is used to consume after retirement. At the time of death there is, accidentally or on purpose, residual wealth, which is transferred in the form of heritages to the next generation.

An important part of the national wealth from the perspective of intergenerational transfers relates to wealth in the form of pension rights. The item P_{g65-} represents the pension rights of those who are still active in the labour market under the age of retirement of 65. The second item P_{g65+} relates to the pension rights of the retired who are entitled to pension payments. These items appear as liabilities at the balance sheet of the funds. Formally these items comprise the present value of the capital funded pension rights build up while working. According to the data base of MORKMON, which does not allow a breakdown between those active in the labour market and those who already receive pension payments, these pension rights amount to about 170% of GDP. As an alternative Kuné (1996) has proposed to include also pension rights which are acquired according to the first pillar of the Dutch pension system, the pay-as-you-go old-age pension scheme (AOW), as an asset in this balance sheet.

Then, this part of the pension right item would appear at the liability side of the balance sheet of the government. Such extension would be in line with the reasoning that intergenerational transfers, such as the AOW, can, at the same time, be regarded as intertemporal transfers. Yet, as the legal basis of the rights with respect to AOW are essentially different from those with respect to the capital funded pensions, this part of the pension rights is not regarded as an additional asset of the household sector here. On the other hand, because payments of pension premiums are exempted from income taxes, but pension payments are taxed in The Netherlands, one could argue (and the Ministry of Finance sometimes does) that part of P_{g65-} and P_{g65+} should appear on the asset side of the balance sheet of the government rather than on the balance sheet of the household sector. This discussion illustrates that, more in general, there is some arbitrariness in allotting assets in their full amount to the household sector in case taxation or some other contractual obligation leads to compulsory income transfers (which are sometimes intergenerational transfers).

Another important part of the financial assets of households is the item $K_{g,bd}$, which is at the liability side of the firms, and which represents the value of the part of firms that is owned by households in the form of bonds, shares and direct ownership. Although this item relates to a financial asset, it already poses problems of valuation. As far as this item relates to the ownership of firms who have their shares traded at the stock market, it could be valued at current stock market prices, if necessary corrected for erroneous fluctuations. However, at the macro level of the Dutch economy, ownership of firms whose shares are not traded, is also part of this balance sheet item. As the MORKMON data obviously do not take a full account of this ownership this total value of this item may very well exceed the 66% mentioned in the table.

The items at the asset side, $K_{g,o}$, represents the relatively small amount of loans of households to the government, mainly in the form of government bonds and for a small part as short-term government debts. The item $K_{g,b}$ at the liability side of the balance sheet of the households mainly consist of mortgage credit borrowed from banks and for a small part it is consumer credit.

The other financial assets of the household sector are less relevant from the perspective of transfers. Item $G_{g,b}$, represents the broadly defined money stock. It includes notes and coins, bank accounts, saving accounts and long-term credit to banks.

As far as households hold bonds and shares of banks, this is included in the item ownership of firms. Net foreign assets of households (NBA_g) comprise, amongst others, foreign bonds of the households and participation in foreign firms. As far as households borrowed money abroad, it is subtracted from this item. Yet this item is quantitatively not of much importance.

Net financial wealth (V_g) is only part of total wealth of households. In order to arrive a total wealth the item 'other assets of households' (OA_g) has been added, both at the asset side and at the liability side of the balance sheet of the household sector. It is evident that empirical valuation of this item which includes both real and immaterial wealth poses even much more problems than valuation of the ownership of firms by households.

In the first place other assets include material assets such as buildings, land and movables such as cars and boats. However, presumably of much more importance is the human capital and the social capital of a nation. The human capital of an individual can be seen as the present value of labour income to be earned during residual life time. Human capital is built up through education. Human capital may also increase while working because of the building-up of experience, but its value will decrease when the individual becomes older so that a number of years that he or she is able to be actively working in future becomes smaller. Human capital of an individual can be calculated as the discounted surface under the age-income-profile for the residual length of the working life (see Fase, 1970). Along these lines Fase (1975) has tried to determine the size of human capital in money terms at the macro level by adding up these discounted life time earnings for individuals by level of education. His estimates for total human capital in the Netherlands in 1965 amount, given a discount rate of 4%, to about 650 billions of guilders. This is more than three times the estimate of the stock of capital goods and about ten times the value of national income. This very tentative estimate would imply that at present the value of human capital In The Netherlands is about 8 trillion Dutch guilders.

In a similar way social capital could be calculated as the present value of the unpaid labour (care, work at home) of an individual during his or her life time. The valuation of social capital in this manner is, of course, somewhat of an incongruity, because unpaid labour can, by definition, not be valued in money terms. Yet, such valuation has been undertaken, e.g. by Bruyn-Hundt (1996). This calculation shows that the economic value of unpaid labour is of about equal size as paid production. Another type of calculation is made by Bastianen, Den Butter and Van Ours (1993), who estimate that the opportunity cost of non-participation, and of the complement of part-time work amounted to about 100 billions of guilders in 1985, which is about 25% of national income in that year. Yet, human capital and social capital are only partly substitutes; today individuals combine, more often than before, time spent for care with time spent for paid work.

A further major complication in valuing human capital and social capital is that they both bring about external effects, so that in fact total human capital in a society cannot be set equal to the sum of human capital of individuals. Therefore, the valuation of human capital, and also of social capital and consequently of the wealth of a nation, depends very much on the way this capital is utilised. For instance, highly educated individuals can be more productive in a modern, well organised welfare state than in a country of economic disorganisation. Accordingly the value of social capital will much depend upon the strength of values and norms in the country and to the extent that the country is considered a good civil society. From an economic point of view the value of social and human capital will also depend much on the presence of well-functioning markets. Anyhow, it is obvious that the total wealth of households, represented by the item $V_g + OA_g$, which is hardly measurable, forms an important part of total wealth of the country, and therefore is also of great importance from the perspective of transfers. For instance, a disruption of the economic or social system or a loss of values and norms which enhances transaction costs, implies a large loss of wealth. Again this discussion shows that there is some arbitrariness in allotting assets either to the household sector or to the government sector. It illustrates that, when measuring the total wealth of a nation, it is hard to discriminate between the wealth of

the household sector and the wealth of the government. In the end, the wealth of the government is owned by us all. Yet, for the taxonomy of transfers this distinction between the household sector and the government sector is useful.

The balance sheet of firms

The value of firms is mainly determined at the asset sides of the balance sheets of households and of funds. The value of the firms is ascribed to its owners by means of the items ‘credit granted’ by firms and funds ($K_{g,bd}$ and $K_{f,bd}$) at the asset side of the respective balance sheets. In this set-up the own wealth of firms ($V_{bd} + OA_{bd}$) is, by definition, nil. That’s why the balance sheet of firms is of less importance from the perspective of intergenerational transfers. At the liability side of the balance sheet of the firms, the items $K_{g,bd}$, $K_{b,bd}$ and $K_{f,bd}$, represent the debt of firms to resp. households, the banking system and funds in the form of bonds, shares and direct ownership. The problems of valuing these items are already discussed previously at the balance sheet of households. Apparently the largest problems of valuation occur with households, because participation in firms will be valued in money terms in the individual balance sheets of banks and funds in their annual reports. The claims of firms on banks ($G_{bd, b}$) and the net foreign assets of firms (NBA_{bd}) appear at the asset side of the balance sheet of firms. The latter item has a large negative value in 1999, which indicates that firms in The Netherlands take a large foreign debt. Participation of firms in other firms and also shares owned by firms do not show up in the balance sheet at the macro level because of consolidation.

Finally, like with the household sector, the balance sheet of firms is extended both at the asset side and at the liability side with the item ‘other assets’ (OA_{bd}). It represents, besides the capital good of firms, the non-material assets of firms, such as goodwill, reputation and technology capital. Finally, of course, non-movables, such as offices are part of this item. Due to the problems of valuation problems mentioned above, calculation of OA_{bd} as a residual from the balance sheet identity in the MORKMON data, will by no means provide a relevant value for these other assets of firms.

In this balance sheet net wealth plus other assets represent gross wealth of the firms at the macro level. When the ownership of capital of the firms has been valued correctly at the asset side of the balance sheet of households, funds and banks, this gross wealth item should be equal to nil. It implies that, given the financial means of the firms and their net foreign assets, stock market prices yield an implicit valuation of the other assets of firms and hence of the value of capital goods and of immaterial capital. Moreover, theoretically this valuation fully accounts for the future earning capacity of the capital stock and the technology capital of the firm, including the risk that the value of this material and immaterial capital of the firm decreases. From the point of view of the stockholders the value of the firms is equal to the present value of future profits. Of course, this valuation brings about a lot of speculation which explains why the valuation of firms at the stock market is highly volatile. Yet this system of balance sheets illustrates how a reassessment of the capital value of firms, due to new investments in capital goods, technological innovation, but also because of changes in preferences and technology which becomes obsolete, leads to shifts in the wealth position of households and funds. Shifts in the wealth of banks are not relevant here because it is assumed that changes in the capital value of banks are accounted for at the balance sheets of the firms.

The balance sheet of funds

In principle the wealth of funds could be treated in the balance sheet in the same way as that of firms and be completely attributed to its owners. However, because pension rights are formulated as the right to payments, and not as the right to the pension capital which has been built up in order to enable these payments, intergenerational transfers take place through pension funds, which would be out of sight in case of such complete attribution of ownership. The own wealth of the funds (which cannot be attributed to a generation of pensioners) is rather substantial.

The investments in pension capital appear at the asset side of the balance sheet of the funds. They include investments in bonds and shares of firms ($K_{f,bd}$), government bonds ($K_{f,o}$) and foreign shares, bonds, and direct investments (BA_f). These investments should cover the pension rights, which are built up ($P_{g65-} + P_{g65+}$), and which appear at liability side of the balance sheet. These investments are, however, not necessarily equal to the pension rights. Like with firms, there are major uncertainties with respect to the valuation of both assets and liabilities. As funds provide firm capital, through this financing mechanism the uncertainty about valuation of firms is, to a considerable degree, diverted to the funds. Besides there is a second source of uncertainty with respect to the long run obligations of pension funds and life insurance companies. Because of a cautious valuation of both assets and liabilities these funds have, in most cases, wealth of their own (V_f). Together with the other assets of the funds (OA_f), which in this case are only buildings and offices, this wealth constitutes a buffer for the funds.

Yet, a difference must be made between pension funds and life insurance companies. Life insurance companies are bound to make profits for their owners. A part of these profits is passed to the people who are insured with the company. So these policyholders become, through the distribution of profits, in a way owners of the company. Some part of the profits is paid to the shareholders or will result in higher share prices of the company. Individual households and pension funds are, therefore indirectly owners of the net wealth of life insurance companies. On the other hand, pension funds are foundations which are not supposed to make profits. Here net wealth is owned by nobody else than the pension fund itself. Partly the funds use this overvalue for indexing pension rights. Another part is returned as a reduction of the premiums to those who built up their pension rights. These buffers of pension funds play an important role in intergenerational transfers. The fact that these buffers are not *a priori* attributed to a specific generation contributes to the intergenerational efficiency of pensions. (See e.g. Boender *et al.*, 2000).

The balance sheet of the banking system

Like that of the firms, the balance sheet of banks is of less importance from the perspective of intergenerational transfers. Banks are financial intermediaries and therefore money creating institutions. Bank credit to households, the government and firms is at the asset side of the balance sheet, together with a relatively small amount of net foreign assets (NBA_b), which is the difference between foreign claims and debts of the domestic banks. The next item at the asset side, the gold and foreign exchange holdings (stock of international reserves) (IR) appears as an asset on the balance sheet

of the Dutch central bank. Items at the liability side of the balance sheet of the banks are the financial means that households and firms hold with these banks (including the central bank). These two items represent the money stock. Because this stock is of major importance from the perspective of monetary policy, it has been subject of ample empirical studies on the demand for money by Martin Fase and his team (see Fase and Kuné, 1974, 1975, Den Butter and Kuné, 1976, Fase, 1979, Den Butter and Fase, 1981 for early studies, and Fase and Winder, 1990, 1993, 1998, and Fase, 1994 for more recent studies). At the liability side of the balance sheet is also the Treasury's balance at the central bank (SSCH). Here net wealth of banks (V_b) results from the balance identity. Like for the funds the other assets consist in this case only of offices and inventory. Unlike in the case of firms, the total wealth of banks obtains a positive value because it includes net wealth of the Dutch central bank. Another option would be to include the capitalised value of the Dutch central bank in the balance sheet of the government.

The balance sheet of the government

The total wealth of the government is in principle equal to the value of 'other assets' minus the government debt ($OA_g - K_{g,o} - K_{f,o} - K_{b,o}$). The government debt, which appears at the liability side of the balance sheet, is equal to government bonds held by households, by funds and by banks. In this set-up it is assumed that firms do not hold government debts. The stylised balance sheet also abstracts from possible foreign claims and debts of the government.

The Treasury's balances at the central bank, an item of small value, appears at the asset side of the balance sheet of the government. The cumulated financial deficit of the government ΣFT_o formally closes the balance sheet. This cumulated financial deficit, which is the net government debt, can be regarded as the negative financial wealth of the government and it therefore appears at the asset side of the balance sheet.

By far the main item on the balance sheet of the government which also plays a crucial role in intergenerational transfers, is the item of 'other assets' of the government (OA_o). It includes a great variety of material and immaterial components of wealth, which can be regarded, in one way or another, to be owned by the nation (or in part by God as some would believe). From the perspective of transfers these wealth components are, in the present set-up of the set of balance sheets, attributed to the government, but, as mentioned before, they could as well be seen as belonging to us all and be attributed to the household sector. Of course, firstly it includes capital goods owned by the government, such as the infrastructure (roads, railways, canals, dikes, offices and buildings owned by the government etc.).

However, a major part of wealth, which can be attributed to the government, or more in general to the nation, is intangible and has to do with human capital and social capital. In the discussion of human capital as part of total wealth of households it has already been remarked that, due to a kind of network externality, human capital of an individual will be more productive in an environment with much other human capital. These externalities can be seen as the cultural and social capital of a nation. They also include the entire set of values, norms and behavioural habits of the country. Of

course these various forms of immaterial wealth do overlap to a large extent and are almost impossible to value.

Finally there is the land owned by the government and the local authorities, the natural resources and other environmental capital. It is again debatable whether the government can really be seen as the owner of these important parts of total wealth of a nation. This is especially true when the wealth of the government is regarded to be owned by the present generation. From the perspective of a taxonomy of intergenerational transfers this is a necessary assumption because otherwise there would be no intergenerational transfers of the wealth of the government. Yet, a different and equally legitimate point of view is that it is by no means justified that this common part of a nation's wealth belongs to the present generation. However, a further discussion of these moral issues would go beyond the scope of this paper.

All in all, the above discussion illustrates that the item 'other assets' of the government, in whatever manner it is valued, is very substantial and constitutes a major issue in the analysis of the transfers of a nations' wealth. The higher this item 'other assets' of the government is valued, the larger is the scope for transfers to future generations. Pommée and Baris (1996) and Pommée (1998) made a first inventory of the component parts of national wealth, but their distinction between the various sectors is rather rough. In an valuation exercise of a more narrowly defined capital stock, Verbiest (1997) estimates that the value of the total capital stock in 1992 is about five times the value of GDP. Of this capital stock the government owned 94% of GDP. Aalbers, Bettendorf and Vollebergh (1999) tried to value the open space in the Netherlands, as part of total wealth of the country, by considering price differences between land use for housing and farm land. They calculated this open space to have a value of 2374 billions of guilders in 1996, which is more than three times the value of GDP. These high values of these components of national wealth indicate that the total wealth of the government ($OA_0 - \Sigma FT_0$) is most certainly positive, given the actual value of the government debt. Moreover, there is no doubt that, in this broad definition, total wealth of the government is substantial as compared to that of the other sectors. Of course, there exists a fundamental difficulty in combining monetary, material and immaterial assets (and liabilities) in this balance sheet. Whereas monetary and material assets can be, more or less, valued in monetary terms by their direct (market) value, or by a discounted income stream from them, assets with no market value, such as environmental capital, are to be valued in another fashion, e.g. by the discounted value of future utility derived from it. There is much discussion in the literature in what sense such methods of valuation, e.g. contingent valuation, can be compared with direct valuation by means of market value.

The balance sheet of the foreign sector

The balance sheet of the foreign sector constitutes the residual balance sheet in this closed set of balance sheets. According to this balance sheet the sum of the claims of the domestic sectors on the foreign sector are equal to the cumulated surplus on the current account of the balance of payments (ΣLR). The balance of payments, both its current account and its capital account, is, in this manner, included in this set of balance sheets in a consistent way. As the Netherlands has witnessed large current account surpluses for a long period one would expect the net foreign assets to be quite

substantial in this balance sheet. Yet such large cumulated surpluses do not show up in the MORKMON data, which may be due to various registration problems with respect to direct foreign investments and the returns to these investments.

From the perspective of intergenerational transfers the balance sheet of the foreign sector is important because there are two reasons why, in a greying society, the possibilities are limited to use domestic savings for the funding of pensions, and for future expenses of care, by domestic investments. The rate of return of investments in domestic firms depends upon future productive capacity. In case labour supply in a greying society sets a limit to that future productive capacity, the rate of return on investments will decrease and the payment for labour as the scarce production factor, will increase. Enhanced wage inflation may, in this way, reduce the value of pension savings. Investments in economies with a different demographic pattern may, in that case, be more profitable, albeit that it brings about information costs and that the rate of return of the pension capital becomes dependent upon the economic policy and the resulting exchange rate uncertainty in the countries where the capital is invested. More in general, with a greying population, our country is at risk to become dependent on capital income to a large extent. The second reason why the scope of domestic investments is limited, is that these additional investments generate additional welfare and therefore lead to higher payments of pay-as-you-go pensions (AOW) and expenses for care. A higher cake makes the distribution problem more easy, but does not solve it. For that reason the difference between the pay-as-you-go pension system and the capital funded pension system is less essential than sometimes argued.

3. A taxonomy of transfers

The close set of extended balance sheets in the previous section provides a starting point for distinguishing various types of transfers. The three major categories are:

1. Transfers of wealth
2. Transfers of income
3. 'Transfers' due to revaluation of wealth

The transfers of income can be subdivided further in

1. Indirect or non-specific income transfers
2. Direct or specific income transfers

Below examples of each of these types of transfers are discussed with reference to the closed set of balance sheets. In most cases it appears to be very hard, if not impossible, to quantify these transfers for a certain moment in time given the data which are available. Moreover, it appears to be quite difficult also to discriminate between genuine intergenerational transfers and transfers which have an intertemporal or intragenerational character (transfers which lead to redistribution of income and/or wealth within generations). Of course, the question whether the transfer can be regarded as an intergenerational transfer depends much on the definition of generation, which is in this case a cohort of people born within the same time period. If that period is, say a year, most transfers will indeed be intergenerational transfers. However, with larger cohorts, there will be more intragenerational transfers. This way of defining generations and looking at intergenerational transfers makes the taxonomy

more complicated and diffuse than when intergenerational transfers of wealth were just calculated as the differences between total net wealth of households, funds and the government ($V_g + OA_g$, $V_f + OA_f$, OA_g) at time $t+1$ and time t . Such direct calculation of intergenerational transfers as flows of wealth is deficient because generations overlap.

Transfers of wealth

In the closed set of balance sheets of the previous section the nation's wealth is attributed to three sectors, namely

1. Households ($V_g + OA_g$)
2. Funds ($V_f + OA_f$)
3. The government ($OA_g - \Sigma FT_o$)

The wealth of firms is allotted via property rights to households and funds. The net wealth of the Dutch Central Bank is taken as part of the wealth of the government and the wealth of the commercial banks is considered part of the wealth of firms, and so consequently of households and funds. The result is that, given this set-up of the sectoral balance sheets, transfers of wealth take place between these three sectors or within one of these sectors; in fact in the latter case only transfers between or within households are relevant.

Heritages and gifts constitute the main intergenerational transfers within the sector of households. The major aim of building up wealth in households is consumption smoothing during lifetime. So the leftovers for intergenerational transfers are relatively small. However, the distribution of wealth is very skewed so that a large part of the wealth transfer to younger generations is concentrated within a few households. This is the capital of the family, often in the form of firm property, which is passed over to the younger generations within the family. The most recent estimate of the Central Bureau of Statistics for the size of these transfers goes back to 1985. It amounted to 6.7 billions of guilders which was 1.6 % of GDP. It should be noted that a part of these transfers were transfers to longest living partners and can, therefore, not yet be considered as intergenerational transfers. However, no data are available on the age of those who require heritages or bequests.

A large part of the wealth of households consists of human and social capital. Obviously this kind of capital cannot be transferred to future generations as it is embodied in individuals. Yet some of this capital is transferred to younger generations by means of education and instruction. These are transfers of income rather than of wealth and will be discussed later.

One of the most interesting balance sheet items from the perspective of intergenerational transfers is the wealth of funds. The major part of pension savings at funds do not lead to intergenerational transfers. Pension rights are calculated on a risk basis, but the surplus from somebody who dies at a younger age is used to cover the loss of somebody who lives longer than on average. The following indicates how funds do contribute to intergenerational transfers.

In the first place funds administrate early retirement arrangements which are financed on a pay-as-you-go basis. In this case active participants pay the benefits of those who

make use of the arrangements. However, in The Netherlands these early retirement arrangements, which were introduced in the 1980's but which are now redressed, were only used by some cohorts. Therefore, they constitute transfers of wealth to the generation which is at the moment between 55 and 75 years of age.

In the second place there are transfers of wealth by funds because they calculate an average premium for the pension right which has been built up. For that reason an individual of 46 years pays the same amount for a guilder of pension rights as somebody of 25, whereas the true costs of this pension rights are about a factor of 5 as high. As long as an individual has a standard working career, this does not result in intergenerational transfers. When one is young, one pays a higher premium as compared to the right, which is to be built up, and when one is old the premium is too low. In a simple balance sheet of one pension fund with one participant this transfer is to be considered as a temporary increase and later use of own wealth (V_f), and can then be considered as an intertemporal transfer. Yet, in most cases also future premium income and future pension rights of present participants are registered in the balance sheet. In that case there is no formation of own wealth along these lines and hence there are also no intertemporal transfers. However, when an individual does not follow a normal working career, it will in fact create intergenerational transfers, but its direction is not known beforehand. There is some analogy between this transfer and the smoothing out of the risks of death with the annotation that changes in the working career, differently than the timing of death, are the consequences of own choices and, therefore, cannot be insured in the classical way.

The third way of intergenerational transfer of funds occurs with indexing of pension rights, which have been built up. The backservice because of wage inflation in pension systems where payments are related to the last earned wage, is partly included in the average premium mentioned before. Besides there exists a backservice on premium free pensions and on already established pension rights. With sufficient own wealth of funds this wealth can be used in order to enhance the pension rights of participants. It is in fact for this reason that the wealth of funds has been formed: to strive at a certain level of pension rights without a hard guarantee. It depends on the extent to which the level of pension rights is linked to general welfare, but the indexing of pension rights or the decision not to index pension rights, results in a intergenerational transfer from young to old or from old to young.

The fourth type of intergenerational transfer with respect to funds relates to the part of the wealth of the funds which, from a legal point of view, does not have an owner. On the moment the fund decides on the spending of this wealth, there is a transfer. When the choice is for backward indexing, specific participants profit from the transfer. In case the premium is reduced, the owners of firms, and, so far as they explicitly pay premiums, the employees take the benefits. When the wealth is returned to the firm, it is mainly transferred to the shareholders. The wealth of funds can also be transferred to pension rights so that intermediate changes occur in these pension rights. For instance by means of another franchise, or when an early retirement arrangement is transposed to a flexible pension. Again the direction of the intergenerational transfer because of the use of the wealth of the funds depends on the specific circumstances.

The last and fifth way in which the strategy of the funds gives rise to intergenerational transfers relates to the part of wealth of the funds which is not passed to specific

owners, but which remains in the fund as a buffer for bad times. These buffers enabled the funds to take higher risks in investing their wealth so that generally in the long run a higher rate of return can be reached. These buffers can be used to compensate cohorts whose pension capital yields a lower rate of return than expected, at the cost of cohorts with a high rate of return. Therefore, these buffers are always a transfer to the next cohorts of participants.

From the perspective of intergenerational transfers of wealth, the wealth of the government belongs to us all indeed. A person who dies loses his or her share without compensation. A new-born baby receives its share as a gift by becoming a new citizen of the nation. By its nationality each citizen is not only allowed access to technical and economic infrastructure, but also takes part in social capital in the form of cohesion and good governance. Migration indicates that this citizenship is valued rather as a benefit than as a burden. Besides, the government sees to it that part of the wealth of households is transferred to the next generation of citizens in the form of succession duties. It is obvious that the value of these intergenerational transfers of the nations' wealth which appears on the liability side of the balance sheet of the government, depends very much on the property rights of this wealth. So one can argue, e.g., about who is the owner of the environmental capital. When the environmental capital is considered to be owned by the present generation, the next generation should be grateful if the present generation transfers part of this environmental capital, in the same way as the present generation should be grateful to the previous generation that they did not consume all environmental capital. When, however, the present generation is considered only as a temporary conservator of environmental capital, use of part of the environmental capital by the present generation can be seen as a transfer from the younger to the older generation.

Transfers of income

Income transfers take place between households and the government, within households and between households. Part of these transfers are intergenerational transfers. As all transfers of pension funds and life insurance companies are considered as transfers of wealth in the previous subsection, there is no need for a further discussion of intergenerational transfers of this sector here.

Indirect or non-specific transfers

The major part of the indirect or non-specific income transfers relates to transfers from households to the government and *vice versa*. These transfers from households to the government consist of the various forms of direct taxes and social premium payments. Non-specific transfers from the government to the households mainly consist of social security payments. This redistribution of income of the household sector via the government is known as the transition from the primary to the secondary income distribution. The social accounting matrix (SAM: Central Bureau of Statistics, Timmerman and Van de Ven, 1994) allows in principle a division to various age categories. The major part of the redistribution of income by means of social security takes place within the age groups of those of working age, but there is a considerable redistribution over age groups. Out of the total of 83 billions of guilders of social security payments in 1996, 35 billions of guilders are transferred to the elderly in pay-as-you-go state pension payments (AOW) and 4 billion of guilders

to early retirement. Moreover, social security payments for disability and illness (27 billion of guilders) appears in fact to be for a considerable part redistribution from younger to the older age groups. Yet, not all of the revenues of the government sector stem from households. The total tax income of the government in 1996 amounted to 179 billions of guilders with 27 billions of guilders of corporate taxes from the firm sector and 39 billions of guilders as non-tax revenues of the government. So the household sector only partly contributes to the income of the government which is on its turn transferred to other households.

As far as income transfers between households and the government can be attributed to various age classes, the net gain from the transfers of the government can be calculated for these age classes. The specific or direct transfers discussed in the next section can also be included in this calculation. However, because transfers through the government take place within the framework of the total budget, it is impossible to establish a fully completed matrix of transfers between the various age classes for the household sector. Such transfers can only be measured accurately for an arrangement such as the old age pensions where premiums are paid by other age groups than those who received the benefits. (This is, of course, no longer true when the pay-as-you-go pension payments by the government will be fiscalised). A further complication of such attribution of these general transfers to specific age groups and hence to specific generations is that various generations live together within households, where expenditures within the households are more or less dependent upon the whole budget (see, however, Kooreman, 2000, for the spending behaviour with respect to children's allowances).

Of course transfers of income within households and between households are not included in the flow of funds which can be derived from a set of macroeconomic balance sheets. Within households the major part of income transfers stem from the working partners. Income earned by children is relatively small and even when children have income, it is not much spent on household purposes. From a survey of recent methods by Pott-Buter and Groot (1987), conclude that households spend 10 à 20 % of total household income for each child. The common finding is that older children are more expensive than younger ones and that expenditures for the first child are higher than for the other ones. However, it is questionable whether these expenditures should be considered as a transfer to children rather than as consumption of parents. Van Praag and Plug (1993) use an income valuation method to argue that having children enhances the welfare of households through immaterial benefits.

Income transfers between households consist of alimentation and other types of support. Statistically they cannot be separated from gifts which are defined as transfers of wealth in the previous subsection. Rough estimates show that these transfers amount to about 3 ¼ percent of GNP (see Lemmens, 1988).

Direct or specific transfers of income

Like in the case of general income transfers, there are three types of specific income transfers, namely between households and the government, within households and between households.

Specific or direct transfers from the government to households are difficult to measure, and if so, to attribute to age groups and generations. In general these transfers are part of the so-called “profit from the government” which marks the difference between the secondary and tertiary income distribution. Research in this field has been done by the Social and Cultural Planning Bureau (Pommer and Ruitenberg, 1994). As far as these transfers can be attributed to individual households and/or age groups it appears that the distribution of the total of these transfers with respect to the age of the head of the household is less skewed than the net gain with respect to various types of non-specific transfers. The expenditures for health care and societal services appear to be especially profitable for the older age groups but on average the net profit for the elderly is lower than on average. It is especially the age group 40-49, which, according to this calculation, profits from the transfers. However, these are mainly educational transfers, so that it will obviously be for a large part the children of these households which benefit from these transfers. On the other hand there are also specific transfers from households to the government in the form of indirect taxes.

When considering these transfers the picture which age group or generation profits most from these transfers, is still very incomplete. About 75% of the government expenditure other than social security expenditure is not passed to individual households. It applies for the expenditure for public administration, defence, the legal system, development aid, etc. The net profit that can be calculated for the various age groups depends very much on the choice whether such expenditures are excluded from the calculations or whether they are equally distributed over the various households.

These problems of measurement are linked with the discussion on the capital account of the government and how interest payments on government debt influence intergenerational transfers. The crucial question is whether the relevant government expenditure can be seen as investments or as government consumption. Because the total wealth of the government is difficult to measure, it is tempting to label consumptive government expenditure as investment. In the latter case it can be regarded as a transfer of capital goods to future generations so that financing by means of a government deficit, which is a burden for future generations, can be justified more easily (Hebbink, 2000, distinguishes the effects of both types of government expenditures in the context of generational accounting).

Non-financial (and hence direct) transfers within households are more difficult to measure. These transfers include e.g. time spend for education of children and care for the elderly. It is mainly by education and schooling that human capital of a new generation is formed. Even when it could be measured how much time parents and teachers spent on education and schooling, it is questionable whether this human capital can be regarded as a indivisible individual property or as an asset transfer from generation to generation.

Finally there are direct and non-financial transfers between households, such as voluntary work and informal care. In the case of voluntary work it is also sometimes questionable what generations benefit from this work. When voluntary work is done as care for the elderly it is clear which generation profits, but it is less clear when the work is done for a football club or for a political party.

'Transfers' because of revaluation of wealth

The last type of transfers between generations in this taxonomy relates to the revaluation of the various components of wealth. In fact these transfers differ considerably from the two types of transfers considered before, as there is no flow of money, or of an immaterial asset, from one sector to another sector, or from one generation to another generation. That is why, these transfers are labelled here as 'transfers'. Yet, especially in the long run, which is relevant in the case of intergenerational transfers, these revaluations may be considerable. At the same time it is obvious that these transfers are extremely difficult to quantify and are, therefore, completely disregarded in the discussions on the balance of transfers between generations. A number of examples below clarifies the character of these transfers.

Revaluation of a certain component of wealth can be either caused by changes in preferences and by changes in technological knowledge. When asbestos was found to be hazardous for health, it caused a considerable decrease in the asset value of buildings which contained asbestos. Moreover, this revaluation became larger as it became more expensive to remove the asbestos because the conditions for removal became more restrictive. In a similar manner the asset value of farms with cattle for meat production will become smaller now that the perception of becoming ill from eating cow meat has increased due to medical knowledge on the relationship between BSE and the variant of the Creutzfeld Jacob disease. Here the revaluation of the asset value is the consequence of a combination of technological knowledge and changes in preferences.

Large implicit transfers of wealth also occurred because of the oil price shocks in the 1970's. In the first instance the increase in the price of oil enhanced the value of oil reserves considerably. It also enhanced the value of the stock of natural gas, e.g. in the Netherlands. However, during the 1980's the world became less dependent on oil supply by the OPEC countries because the higher oil price made exploration and exploitation of oil stocks elsewhere in the world profitable. This resulted in a decrease in the oil price so that the OPEC countries had to enlarge their supply in order to get the same amount of revenues as just after the oil shock. It shows that both price formation and proven existence of stocks have a large influence on the asset value of this natural resource. In the long run the effects may even be bigger. The stocks of peat and coal lost almost all of their value due to the exploitation of oil and gas. May be the same will happen to these stocks of oil and gas when another means of production of energy becomes more profitable.

Major fluctuations also occur in the valuation of technology capital. The invention of the wheel seems, with the benefit of hindsight, almost invaluable and constitutes a huge transfer of wealth from the older to the younger generation. Yet the asset value of an existing technology may also diminish considerably by invention of a new and superior technology. An example is the value incorporated in the Zeppelin technology, which decreased because of the Hindenburg accident but also because of the rapid development in aircraft technology. May be some revaluation of this technology capital may occur because environmental preferences with respect to noiseless air transport. In the framework of the set of macroeconomic balance sheets it should be noted that a change in the value of technology capital implies that the net

wealth of the firms changes, which is attributed to the owners of the firms. The result is an increase in the respective balance sheet item at the asset side of the households and of the funds, so that it enhances the financial surplus: $(OA_{bd} \uparrow \Rightarrow K_{g,bd} \uparrow; K_{f,bd} \uparrow)$. Due to spin-offs and positive external effects the item other assets of the government also increases. Therefore such positive revaluation of technology capital in fact means that capital has been created. A similar reasoning holds with respect to booming housing prices, although in that case there are little (positive) external effects.

Transfers due to revaluation may also be a direct consequence of the problem of the greying of the population. Due to the relative small size of the younger generations the supply of labour in the industrial countries will stagnate. Because of the relative favourable demographic composition of the Dutch population and the scope for further labour participation this problem is somewhat less serious in the Netherlands than in other industrial countries. Yet a shortage at the labour market may, due to wage increases, make productive capacity less profitable and generate inflation. It reduces the value of pension savings and will lead to an increase in the costs of labour intensive services on which mainly the elder generation depends.

Crucial in the discussion on these transfers due to revaluation is that the present generation cannot but value the stock of technological and environmental capital according to its own norms. However, it does not permit this generation to be myopic and disregard the need for future generations, as the example of the asbestos shows. In case future generations will have other norms and preferences, they will value their heritage from the previous generations differently. That question is up to the next generations. It is the task of the present generation to derive from their moral standards which part of the capital they want to consume, and which part of the capital they will leave over or build up for the next generations. Given the fact that generations overlap, they might discuss these transfers with the younger generation already born. This younger generation will value the capital by its own preferences, including its view on what to leave for the next generations. These kinds of differences in valuation would, in case a monetary valuation were possible, lead to large fluctuations in the long run in the time series of total wealth in the various sectors of the set of macroeconomic balance sheets.

Conclusions

The extension of a closed set of financial balance sheets for six sectors in the economy with non-financial and immaterial assets illustrates how the components of a nation's wealth are allotted over these various sectors of the economy. Moreover such a consistent survey of the components of wealth and the resulting flows of funds associated with income transfers is needed in order to come to a full description of intergenerational transfers. Yet, the exercise of this paper is, as a matter of fact, restricted to mere bookkeeping. Two questions from the literature on intergenerational transfers have not been addressed.

The first is that of intergenerational equity. Intergenerational equity is addressed by the methodology of generational accounting, which were first outlined by Auerbach et al. (1991) (see Bovenberg and Ter Rele, 1999, for a recent application to The Netherlands). These accounts provide two related insights into fiscal policy (see also

Banks, Disney and Smith, 2000). In the first place they show how much, in total, current generations should expect to pay on average in net taxes over the remainder of their collective lifetimes given the spending commitments of the government. Secondly, generational accounts compute how much future generations will have to pay on net taxes. Generational accounts can be used by the government to see whether actual fiscal policies lead to fiscal imbalances in the accounts - that is to say that one generation pays more to the government than is redistributed to that generation so that another generation takes a profit. Large imbalances in the accounts may indicate that the fiscal policy is not sustainable. Sometimes the generational balance in the accounts is also associated with justice in the intergenerational relationship. However, apart from the various technical criticisms raised against the method of generational accounting, our taxonomy of transfers shows that income transfers which result from taxation and redistribution of tax income by the government, only form a tiny part of total transfers. Therefore, a generational balance in this respect by no means implies that there is a just balance in all intergenerational transfers. Moreover, both from the theoretical point of view (see Rawls, 1971) and from the practical point of valuation and measurement, justice does not seem to be a useful criterion to judge intergenerational transfers. Yet sustainability of fiscal policy and preservation of the implicit contract between generations requires that intergenerational imbalances will not be come to big.

The second question not addressed in this paper is the behaviour that determines the size of the various components of wealth, its redistribution and the resulting transfers. This behaviour is described in models for overlapping generations (see the seminal prototype models of Samuelson, 1958 and Diamond, 1965). However, these models are highly abstract and do not differentiate between the various types of intergenerational transfers distinguished in this paper. So, even when good measurement and valuation of all components of a nation's wealth would be possible, building a behavioural model which explains all items of the extended set of balance sheets, would remain an agathotopian dream.

References

- Aalbers, R., L. Bettendorf and H.R.J. Vollebergh, 1999, Op grond van welvaart, *Economisch Statistische Berichten*, Dossier de grondmarkt, pp. D12-D17.
- Auerbach, A.J., J. Gokhale and L.J. Kotlikoff, 1987, Generational accounts: a meaningful alternative to deficit accounting, pp. 55-110 in L.H. Summers, *Tax policy and the economy*, Cambridge MA: NBER.
- Auerbach, A.J., J. Gokhale and L.J. Kotlikoff, 1994, 'Generational accounts: a meaningful way to evaluate fiscal policy', *Journal of Economic Perspectives*, 8, pp. 73-94.
- Banks, J., R. Disney and Z. Smith, 2000, What can we learn from generational accounts for the United Kingdom, *The Economic Journal*, 110, pp. F575-F597.
- Bastianen, R.D., F.A.G. den Butter and J.C. van Ours, 1993, Welfare losses due to low employment rates: an exploratory analysis for The Netherlands, *Applied Economics*, 25, pp. 427-438.

Boender, C.G.E., S. van Hoogdalem, R.M.A. Jansweijer and E. van Lochem, 2000, *Intergenerationele solidariteit en individualiteit in de tweede pensioenpijler: een scenario analyse*, WRR Werkdocument W 114.

Bovenberg, A.L. and H. ter Rele, 1999, Generational accounts for the Netherlands: an update, *CPB Report* 1999-3, pp. 19-25.

Bruyn-Hundt, M., 1996, *The economics of unpaid work*, Amsterdam: Thesis Publishers.

Butter, F.A.G. den, 1988, The DNB econometric model of the Netherlands economy (MORKMON), in W. Driehuis, M.M.G. Fase en H. den Hartog (eds.), *Challenges for Macroeconomic Modelling* (North-Holland, Amsterdam), pp. 405-431.

Butter, F.A.G. den, and M.M.G. Fase, 1981, The demand for money in EEC-countries, *Journal of Monetary Economics*, 8, pp. 201-230.

Butter, F.A.G. den, and J.B. Kuné, 1976, De functionele vorm van de geldvraagvergelijking in Nederland 1952:II- 1971:IV, *Tijdschrift voor Economie en Management*, 21, pp. 169-177.

Butter, F.A.G. den, and R.M.A. Jansweijer, 2000, De erfenis van Nederland: intergenerationele vermogens- en inkomensoverdrachten, *VU Research Memorandum* 2000-18.

Diamond, P.A., 1965, National debt in a neoclassical growth model, *American Economic Review*, 55, pp. 1126-1150.

Fase, M.M.G., 1970, *An econometric analysis of age-income profiles* (Rotterdam University Press, Rotterdam)

Fase, M.M.G., 1975, Human capital, distribution of labour income and scope for future consumption, Amsterdam/Rotterdam-Bank N.V., *Economic Quarterly Review*, 41, June, pp. 5-10.

Fase, M.M.G., 1979, The demand for financial assets, *European Economic Review*, 12, pp. 381-394.

Fase, M.M.G., 1981, Financiële activa, rentevorming en financile beheersbaarheid, in: E. den Dunnen, M.M.G. Fase and A. Szász, eds., *Zoeklicht op Beleid*, Stenfert Kroese, Leiden, pp. 43-81.

Fase, M.M.G., 1984, The monetary sector of the Netherlands in 50 equations, in: J.P. Ancot, ed., *Analysing the Structure of Econometric Models*, Martinus Nijhoff, The Hague, pp. 195-228.

Fase, M.M.G., 1994, In search for stability: an empirical appraisal of the demand for money in G7 and EC countries, *De Economist*, 142, pp. 326-356.

Fase, M.M.G. and J.B. Kuné, 1974, De vraag naar liquiditeiten in Nederland, 1952-1971, *De Economist*, 122, pp. 326-356.

Fase, M.M.G. and J.B. Kuné, 1975, The demand for money in thirteen European and non-European countries: a tabular survey, *Kredit und Kapital*, 8, pp. 410-419.

Fase, M.M.G. and C.C.A. Winder, 1990, The demand for money in the Netherlands revisited, *De Economist*, 138, pp. 276-301.

Fase, M.M.G. and C.C.A. Winder, 1993, The demand for money in the Netherlands and other EC countries, *De Economist*, 141, pp. 471-496.

Fase, M.M.G. and C.C.A. Winder, 1998, Wealth and the demand for money in the European union, *Empirical Economics*, 23, pp. 507-524.

Fase, M.M.G., P. Kramer en W.C. Boeschoten, 1990, *MORKMON II; het DNB kwartaalmodel voor Nederland*; Monetaire monografieën 11, Amsterdam: NIBE / De Nederlandsche Bank.

Fase, M.M.G., P. Kramer en W.C. Boeschoten, 1992, MORKMON II; The Netherlands Bank's quarterly model of the Netherlands economy, *Economic Modelling*, 9, pp. 146-204.

Hebbink, G.E., 2000, Demographic ageing and sustainability of fiscal policy: projections with a renewed generational accounting model, *Research Memorandum WO&E*, nr. 609, De Nederlandsche Bank, Amsterdam.

Kotlikoff, L.J., 1992, *Generational Accounting. Knowing who pays, and when, for what we spend*, New York: The Free Press.

Kooreman, P., 2000, The labeling effect of a child benefit system, *American Economic Review*, 90, 571-583.

Kuné, J.B., 1996, *The hidden liabilities. meaning and consequences*, Heerlen: Stichting pensioenfondsen ABP.

Lemmens R.M.M., 1988, Resultaten uit het Sociaal-economisch panelonderzoek: inkomensoverdrachten tussen en binnen huishoudens, CBS, *Supplement bij de Sociaal-economische Maandstatistiek* 5: 4-18.

De Nederlandsche Bank, 1985, *MORKMON, A quarterly model of the Netherlands economy for macroeconomic policy*, Martinus Nijhoff Publishers, Dordrecht.

Pommée, M., 1998, *National Accounts. Measurement and valuation of gas and oil reserves in The Netherlands*, CBS, Voorburg/Heerlen.

Pommée, M. and W. Baris, 1996, *Balance sheet valuation: produced intangible assets and non-produced assets*, CBS Occasional paper NA-081, Voorburg.

Pommer, E. and L. Ruitenberg, 1994, *Profijt van de overheid III. De verdeling van de gebonden inkomensoverdrachten in 1991*, SCP, Rijswijk.

Pott-Buter, H.A. and W.N.J. Groot, 1987, *Kosten van kinderen. Een overzicht*, Nederlandse Gezinsraad, Den Haag.

Praag, B.M.S. van, and E.J.S. Plug, 1993, Kinderbijslag en kindervreugd, *Economisch Statistische Berichten* 20 oktober 1993, pp. 720-723.

Rawls, J., 1971, *A Theory of Justice*, Cambridge: The Belknap Press.

Samuelson, P.A., 1958, An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money, *Journal of Political Economy*, 66, pp. 467-482.

Scientific Council for Government Policy (WRR), 1999, *Generatiebewust Beleid*, Rapporten aan de Regering nr. 55, Den Haag: Sdu Uitgevers.

Timmerman, J.G. and P.J.M. van de Ven, 1994, *A social accounting matrix for The Netherlands, concepts and results*, CBS Occasional paper NA-068 (I & II), Voorburg.

Verbiest, P., 1997, *De kapitaalgoederenvoorraad in Nederland*, CBS, Voorburg/Heerlen.